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RST-08950R (March 2002)

GUIDE SPECIFICATION FOR CONSTRUCTION

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SECTION 08950

INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL WALL/ROOF SYSTEM

03/02

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SECTION 08950

INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL WALL/ROOF SYSTEM
03/02

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NOTE: This guide specification covers the requirements for insulated translucent fiberglass sandwich panel wall/roof system.

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PART 1 GENERAL

1.1 REFERENCES

AMERICAN ARCHITECTURAL MANUFACTURES ASSOCIATION (AAMA)

AAMA 1503	(1998) Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
AAMA 2604	(1998) Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 236	(1993) Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box
ASTM C 297	(1994) Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane
ASTM C 1199	(1997) Test Method for Measuring the Steady State Thermal Transmittance of Fenestration Systems Using Hot Box Methods
ASTM D 573	(1994) Test Method for Rubber - Deterioration in an Air Oven

ASTM D 635	(1998) Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM D 1002	(1994) Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-To-Metal)
ASTM D 1037	(1996a) Test Methods for Evaluating Properties ofWood0Base Fiber and Particle Panel Materials
ASTM D 2244	(1993) Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
ASTM E 72	(1998) Test Methods of Conducting Strength Tests of Panels for Building Construction
ASTM E 84	(1999) Test Method for Surface Burning Characteristics of Building Materials
ASTM E 108	(1996) Test Method for Fire Tests of Roof Coverings
ASTM E 283	(1991) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 331	(1996) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
ASTM E 972	(1996) Test Method for Solar Photometric Transmittance of Sheet Materials Using Sunlight
ASTM E 1423	(1991) Practice for Determining the Steady State Thermal Transmittance of Fenestration Systems

UNDERWRITERS LABORATORIES (UL)

UL 723	(1996) Surface Burning Characteristics of Building Materials
UL 790	(1997) Fire Resistance of Roof Covering Materials
UL 972	Burglary Resisting Glazing Material

NATIONAL FENESTRATION RATING COUNCIL (NFRC)

NFRC 100 Procedure for Determinign Fenestration Product U-Factors

FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM 4471

1.2 SYSTEM DESCRIPTION

A. Section includes translucent fiberglass sandwich panel system for walls or skylights consisting of 2-3/4" thick flat (or curved) factory prefabricated into single units, (including factory installation).

B. Related sections include the following:

1. Structural steel/concrete/wood framing: Section [____]
2. Curbs and supporting members: Section [____]
3. Roofing: Section [____]
4. Metal counter flashing: Section [____]
5. Glass and glazing: Section [____]
6. Masonry: Section [____]
7. Joint sealants: Section [____]

C. Requests for substitutions must be approved in writing or by addendum no later than 10 days prior to bid date and in keeping with Division 1 of the specifications.

1.3 PERFORMANCE REQUIREMENTS

A. Deflection of entire system shall be no more than L/45, unless otherwise indicated.

B Structural Loads: Provide system capable of handling the following loads when supporting full dead load:

1. Wind Load: [_____]
2. Snow Load: [_____]
3. Roof Load: [_____]
4. Negative Load: [_____]
5. Seismic Load: [_____]

C. Air/Water Infiltration: For Water Penetration, curtainwall system shall be tested per procedures of ASTM E 331, and shall show no water entry at WTP=10.00 psf, @ 5.00 gph/ft. squared. Test shall be performed before and after uniform loads are applied. For Air Leakage, system shall be tested per procedures of ASTM E 283, and shall show results of no more than 0.01 cfm/ft. squared @ 1.56 psf (25 mph) and 0.01 cfm/ft. squared @ 6.24 psf (50 mph).

1.4 SUBMITTALS

SD-02 Shop Drawings

Face Sheets and Finishes; [_____]

Submit shop drawings of face sheets and finishes according to Division 1

SD-03 Product Data

Insulated Translucent Fiberglass Sandwich Panel Wall/Roof System; [_____]

Manufacturer's descriptive data, performance charts, and catalog cuts.

Acceptable Manufacturer Products

Manufacturers products listed in this specification are referenced to establish a standard of quality. When the specific product listed is submitted by the Contractor, that submittal will be considered For Information Only. When an equal to that named in this specification is submitted, it shall be for Government Approval (g). The following manufacturer products are specifically mentioned in this specification:

Insulated translucent fiberglass sandwich panel wall/roof system

A. Kalwall Corporation
   111 Candia Road
   P.O. Box 237
   Manchester, NH 03105
   Phone: 603-627-3861
   Fax: 603-627-7905
   www.Kalwall.com

B. Structures Unlimited, Inc.
   P.O. Box 5650
   Manchester, NH 03108
   (800) 225-3895
   www.skylightinfo.com

C. Skywall Translucent Systems
   803 Airport Road
   P.O. box 629
   Terrell, TX 75160
   Phone: 972-551-6470
   Fax: 972-551-6129
   www.Skywall.com

Approved equal complying with design intent and all performance and material requirements.

SD-04 Samples

Color Samples of Face Sheets and Finishes;[_____]

Submit color samples of face sheets and finishes according to Division 1.

Product Sample; [____]

Submit product sample showing thickness, face sheets, colors and insulation 14" x 28".

SD-06 Test Reports

Flame Spread and Smoke Developed (ASTM E 84 by UL 723); [_____]

Burn Extent (ASTM D 635); [_____]

Color Difference (ASTM D 2244;);[_____]

Impact Strength (UL 972);[_____]

Tensile Bond Strength (ASTM C 297 after aging by ASTM D 1037); [_____]

Shear Bond Strength (ASTM D 1002) after 5 different aging conditions;[_____]

Beam Bending Strength (ASTM E 72);[_____]

Insulation "U" Factor (by NFRC 100; ASTM C 236; E-1423 and ASTM C 1199);[_____]

NFRC Certification - Optional;[_____]

Condensation Resistance Factor (AAMA 1503);[_____]

Class A Roof Covering Burning Brand (ASTM E 108);[_____]

Class A Roof System UL Listed (UL 790) - Optional;[_____]

Class I Fire Approval (FM 4471) - Optional;[_____]

Test Reports to be furnished by systems manufacturer in accordance with Division.1, Submittals. The manufacturer shall submit certified test reports by an independent testing organization for each type and class of panel system. Reports shall verify that the material will meet all performance requirements of this specification. Previously completed test reports will be acceptable if by current manufacturer and indicative of products used on this project.

SD-13 Records

Quality Control Monitoring; [_____]

Proof of regular, independent quality control monitoring under a nationally recognized building code review and listing program shall be submitted.

SD-05 Design Data

Energy and Structural Calculations; [_____]

All above data must be submitted with any request to be included as an approved product to bid this section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Erection shall be by an installer which has been in the business of erecting and installing specified materials for at least five (5) consecutive years, and can show evidence of satisfactory completion of projects of similar size, scope and type.

B. Shop drawings to be reviewed and stamped by a registered engineer if required.

C. System manufacturer must be listed by a recognized building code authority, including the International Conference of Building Officials, which requires quality control inspections, and fire, structural and water infiltration testing by an approved agency for sandwich panel systems.

D. Quality control inspections; and required testing conducted at least once each year, shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with "Acceptance Criteria for Sandwich Panels" as regulated by the ICBO-ES or equivalent.

E. Materials and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten (10) consecutive years and which can show evidence of these materials being satisfactorily used on at least six (6) projects of similar size, scope and type within such a period. At least three (3) projects shall have been in successful use for ten (10) years or longer.

F. Performance Requirement: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.

G. Product Options: Drawings indicated size, dimensions and profile to structural translucent panel system. Specifications indicate performance required. Other manufacturers that can meet portions of this specification and wish to be considered alternates must comply with Division. 1, Substitutions and Alternates, and can offer alternate bids for consideration using those guidelines.

1.6 PROJECT CONDITIONS

Field Measurements: Verify dimensions in system installation areas and indicate if dimensions on shop drawings are actual or guaranteed dimensions.

1.7 WARRANTY

A. General Warranty: Any warranties specified in this section shall not alter or change Owners rights and provisions received under other contract documents, and shall be in addition to those documents.

B. Special Warranty: System manufacturer shall provide written agreement to repair or replace all defective panel and system craftsmanship for a period of one (1) year, starting at date of delivery. Installer shall provide one (1) year warranty against leakage starting from date of installation completion.

1.8 PRODUCT HANDLING

Store panels on long edge, several inches above the ground, blocked and under cover to prevent damage. Follow manufacturer's storage and handling instructions.

PART 2 PRODUCTS

2.1 MATERIALS -- TRANSLUCENT FACE SHEETS -- PANEL FABRICATION

A. Translucent fiberglass faces shall be manufactured from glass fiber reinforced thermoset resins by insulated system fabricator especially for architectural use. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.

B. FLAMMABILITY: The interior face sheet shall be UL listed and have a flamespread rating no greater than 50 (20) and smoke developed no greater than 250 (200) when tested in accordance with UL 723. Burn extent by ASTM D635 shall be no greater than 1". Faces shall not deform, deflect, drip when subject to fire or flame, or become detached when subjected to 300 degrees F for 25 minutes.

C. WEATHERABILITY: The full thickness of the exterior face shall not change color more than 3.0 Hunter or CIE Units DELTA E by ASTM D 2244 after five (5) years outdoor South Florida weathering at 5 degrees facing South, determined by the average of at least three (3) white samples with and without a protective film or coating to ensure maximum, long-term color stability. (Seven (7) Units for Class A Roof System, after 30 months exposure.)

D. The exterior face shall have a permanent glass erosion barrier integrally embedded to provide maximum long-term resistance to fiber exposure. Sacrificial plastic surface films, coatings or veils not acceptable.

E. Exterior face sheet shall be smooth, .070" thick and [_____] in color. Interior face sheet shall be .045" thick and [_____] in color. Faces shall not vary more than +/- 10% in thickness, and be uniform in color.

F. Panel system shall be 2-3/4" thick, made of two (2) sheets of translucent fiberglass, bonded by heat and pressure to either an aluminum or composite grid core specifically for architectural use.

G. THERMAL INSULATION: Panels shall have a NFRC laboratory tested "U" factor of [.53, .29, .26, .22, .18] [.23, .18, .14, .10 thermally broken-flat only] by ASTM C 236, ASTM E 1423 and ASTM C 1199. System shall be NFRC certified.

H. LIGHT & SOLAR TRANSMISSION: Panels shall have a light transmission of [_____] and shading coefficient of [_____] per ASTM E 972.

I. GRID CORES:

1. Grid pattern shall be nominal 12" x 24" shoji and symmetrical about the horizontal center line for each flat panel.

2. The thermally broken (aluminum) I-beam grid core shall be 6063 T6 or 6005 T5 with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16". The I-beam grid shall be machined to tolerances of not greater than +/- .002". Thermal break shall be 1" minimum.

3. Panels shall withstand 1200 degrees F fire for minimum (1) hour without collapse or exterior flaming.

4. Thermally broken panels shall give minimum CRF (Condensed Resistance Factor) of 80 by AAMA 1503 measured on the grid line.

J. ADHESIVE:

1. The laminate adhesive shall be heat and pressure resin-type engineered for structural sandwich panel use, with minimum 25 years field use. Adhesive shall pass testing requirements specified by the International Conference of Building Officials "Acceptance Criteria for Sandwich Panel Adhesive."

2. Minimum strength shall be 750 PSI tensile strength by ASTM C 297 after two (2) exposures to six (6) cycles each of the aging conditions prescribed by ASTM D 1037.

3. Shear strength by ASTM D 1002 minimum after exposures to five (5) separate aging conditions:

a) 50% Relative Humidity at 73 degrees F: 540 PSI
b) 182 degrees F: 100 PSI
c) Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
d) Accelerated Aging by ASTM D 1037 at 182 degrees F: 250 PSI
e) 500-hour Oxygen Bomb by ASTM D 572: 1400 PSI

K. IMPACT RESISTANCE:

The exterior face sheet shall be uniform in strength, impenetrable by hand-held pencil and repel an impact equal to 60 (230) ft. lbs. without fracture or tear when impacted by 3-1/4" diameter, 5 lb. free-falling ball per UL 972.

L. Translucent structural sandwich panel shall be a true sandwich panel of flat fiberglass sheets bonded to a grid core of mechanically interlocking I-beams and shall be laminated under a controlled process of heat and pressure, and deflect no more than 1.9" at 30 psf in 10' by ASTM E 72.

M. The adhesive bonding line shall be straight, cover the entire width of the I-beam, and have a neat, sharp edge. In order to insure bonding strength, white spots at intersections of mutins and mullions shall not exceed 4 for each 40 sq. ft. of panel, nor shall they be more than 3/36" in width.

N. Panels and aluminum perimeter frame shall be pre-assembled where practical and sealed at the factory. Panels should be shipped to the job site in rugged shipping units, ready for erection.

O. PERIMETER CLOSURE SYSTEM, BATTENS AND ALUMINUM FINISHES:

1. Closure system shall be extruded 6063-T6 and 6063-T5 aluminum clamp-tite screw type. Curved closure system may be roll formed. (Thermal break system optional for walls.)

2. Aluminum closures to be supplied with 300 series stainless steel screws (excluding final fasteners to building) and shall be factory sealed to the panels. Aluminum battens and cap plates shall be field installed.

3. All exposed aluminum to be (mill) (architectural corrosion resistant finish which meets the performance requirements of AAMA 2604, color to be selected from manufacturer's standards.)

4. Flexible sealing tape shall be manufacturer's standard pre-applied to serrated edges of closure system at factory under controlled conditions.

PART 3 EXECUTION

3.1 EXAMINATION

Do not install systems until conditions adversely affecting installation and performance have been corrected.

3.2 PREPARATION

The general contractor shall prepare openings including isolating dissimilar materials from aluminum system which may cause damage by electrolysis, and shall provide temporary enclosures if required.

3.3 INSTALLATION:

A. The installer shall erect translucent panel system in strict accordance with approved shop drawings as supplied by manufacturer, including fastening and sealing. All surfaces shall be cleaned before sealants are applied.

B. Secure non-moveable joints and accommodate thermal and mechanical

movements.

C. If required, insure weep holes are correctly installed.

D. After other trades have completed work on adjacent material, inspect translucent panel installation and make any adjustments necessary to ensure proper installation and weather-tight conditions.

E. All staging and lifts required for the complete panel system installation and field measuring shall be provided by and maintained by the general contractor.

3.4 CLEANING

Clean panel system, both sides, after installation according to manufacturer's recommendations.

-- End of Section --